Caribou Forever – Our Heritage, Our Responsibility

A Barren-ground Caribou Management Strategy for the Northwest Territories 2011-2015

Northwest Territories Environment and Natural Resources

August 2011

Minister's Message

Barren-ground caribou are one of the great resources of the Northwest Territories (NWT). For thousands of years, people have relied on caribou for food, clothing, trade and cultural identification. Some of our previously declining herds are now stable because of stewardship actions taken by many harvesters and management actions recommended by co-management boards. However, herds remain at low numbers. Everyone has a role to play to continue the recovery of barren-ground caribou.

The previous five-year strategy (2006-2010) resulted in increased investment by the Government of the Northwest Territories and partners to take action to help stabilize declining herds and intensify the collection of information needed to make wise management decisions. The previous strategy was successful in increasing involvement of NWT residents in caribou management through actions such as the 2007 Caribou Summit in Inuvik, long-term management planning for the Porcupine, Cape Bathurst, Bluenose-West and Bluenose-East herds, and many regional caribou workshops.

There has been tremendous commitment by many people to stop the decline of caribou. However, actions are still needed during the next five years to support the recovery of all herds to levels that benefit all residents. Advice and direction from co-management partners and Aboriginal governments are critical in defining specific actions needed for each herd.

Our long-term vision will ensure caribou remain to sustain present and future generations. To achieve this vision, this strategy focuses on five key components:

- Engaging partners;
- Ensuring appropriate information is available for management decisions;
- Managing impacts of key factors on caribou herds;
- Informing the public about their role; and
- Maximizing benefits.

We thank the public for providing comment to improve the Strategy and identifying priority actions. The success of this new five-year Strategy (2011-2015) rests with you. Together, we can ensure our caribou populations will remain plentiful for us and our children.

J. Michael Miltenberger
Minister of Environment and Natural Resources

Table of Contents

Executive Summary 1
Vision, Goal and Objectives 3
Principles 4
Background 5
Key Factors Affecting Caribou 12
Our Challenges 14
The 2011-2015 NWT Barren-ground Caribou Strategy 16
1. Engaging all Partners 17
2. Information for Herd Management 18
3. Managing Impacts of Key Factors 19
4. Public Education and Compliance 20
5. Maximizing Benefits 21
Annual Reporting of Strategy 22
Financial Summary 23
Conclusion 24
Appendix A
Detailed Strategies 25
Appendix B
Detailed Financial Summary (in $'000) 41
Appendix C
Results of the 2006-2010 NWT Barren-ground Caribou Management Strategy 42

Cover photos: GNWT, ENR

Executive Summary

The social, cultural and economic value of barren-ground caribou to residents of the Northwest Territories (NWT) is immense. These migratory herds are harvested by Dene, Inuvialuit, Métis and non-Aboriginal people from nearly all communities in the NWT. Barren-ground caribou herds in the NWT declined between 36 and 91 percent from the 1990s to the late 2000s. The previous five-year strategy (2006-2010) resulted in increased investment by the Government of the Northwest Territories (GNWT) and its partners to take actions to stabilize declining herds and intensify collection of information needed to make wise management decisions (Appendix C). The 2006-2010 Strategy was successfully implemented with our co-management partners and Aboriginal governments. Actions implemented through the Strategy helped stabilize four previously declining herds (Cape Bathurst, Bluenose-West, Bluenose-East and Porcupine); slowed the decline of one other herd (Bathurst); strengthened relationships with Aboriginal and non-Aboriginal groups using barren-ground caribou; and enhanced the research and monitoring efforts necessary to manage other declining herds.

The new NWT Barren-ground Caribou Management Strategy (2011-2015) builds on the 2006-2010 Strategy and previous management planning initiatives recommended by co-management partners, Aboriginal governments, caribou management boards and NWT communities. It supports the Legislative Assembly's vision and goal of maintaining an environment that will sustain present and future generations. The intent of the Strategy is not to replace herd-specific management planning, but to provide a unifying framework for those plans.

The new Strategy is based upon the same principles used in the 2006-2010 Strategy to guide barren-ground caribou monitoring and management. These principles recognize all NWT residents have a role in recovery of barren-ground caribou and the GNWT, Aboriginal governments and co-management boards have leadership roles in making decisions on monitoring and management actions.

We recognize barren-ground caribou herds have historically fluctuated in numbers and some of this variation will likely continue. The overall goal of this Strategy is to maintain numbers of each caribou within their natural range of variation. To achieve this goal, this Strategy focuses on five objectives:

- To engage co-management partners in monitoring and management of caribou.
- To ensure appropriate, up-to-date information is available for management decisions.
- To manage impacts of key factors affecting caribou that are within our control.
- To inform the public about the status of caribou and their role in management.
- To maximize benefits from caribou for NWT residents.

Strategies described under each key objective will support the recovery and long-term sustainability of NWT's herds.

The public review identified the following priority action under the strategies:

- Complete management plans and inter-jurisdictional agreements.
- Increase capacity for involvement by Aboriginal governments.
- Monitor effects of predators and harvest.
- Monitor cumulative effects and develop industry best practices.
- Manage habitat in relation to forest fires and land use activities.
- Promote traditional practices and hunter education.

Implementing the Strategy requires a total investment of $19.1 million over five years. Major costs are associated with the collection of information necessary to make sound management decisions, consultation with Aboriginal partners, capacity building for Aboriginal governments, and public education and compliance programs. Implementation of the Strategy will also require resources from partners who share responsibility for managing caribou herds. These partners include Aboriginal governments, co-management boards, caribou management boards, the Government of Canada and neighbouring jurisdictions (Nunavut, Yukon and Saskatchewan). Some of the objectives in this Strategy are similar to objectives in the draft Nunavut Caribou Strategy Framework and provide opportunities for cooperation. The Strategy identifies the current commitment by the GNWT, projected partnership funding and the new investment required over five years ($11.3 million).

Vision, Goal and Objectives

The 16th Legislative Assembly of the Northwest Territories outlined its vision and goals in the document "Northerners Working Together." Goal 2 of the 16th Legislative Assembly is:

"An environment that will sustain present and future generations."

This is also the mandate of the Department of Environment and Natural Resources (ENR). Implementing the actions described in the new NWT Barren-ground Caribou Management Strategy (2011-2015) will help achieve the vision and goals of the Legislative Assembly by supporting the recovery and sustainability of NWT's barren-ground caribou herds.

The long-term vision of the Strategy is to ensure caribou remain to sustain present and future generations of NWT residents forever. The overall goal of the Strategy is to maintain numbers of each caribou herd within their natural range of variation. To achieve this goal, the Strategy focuses on five objectives:

- To engage co-management partners in monitoring and management of caribou.
- To ensure that appropriate, up-to-date information is available for management decisions.
- To manage impacts of key factors affecting caribou that are within our control.
- To inform the public about the status of caribou and about their role in management.
- To maximize benefits from caribou to NWT residents.

The new Strategy builds upon the success of the 2006-2010 Caribou Management Strategy (Appendix C). It also aligns with management initiatives recommended by co-management partners, caribou management boards, Aboriginal governments and NWT communities. This Strategy, like the 2006-2010 Strategy, does not replace herd-specific management planning, but provides a unifying framework for those plans.

The 2011-2015 Strategy continues actions initiated during the previous Strategy and identified as priorities by the public. This includes: completion of management plans and inter-jurisdictional agreements for herds shared with neighbours; developing increased capacity for involvement by Aboriginal governments; monitoring effects of predators and harvest; further modelling and assessment of cumulative effects of development on caribou; developing industry best practices; promoting hunter education; and managing habitat. Implementing the Strategy requires continued strategic investment by the Legislative Assembly and all partners.

Principles

The following principles continue to guide barren-ground caribou management decisions:

- Management actions will be taken at the herd level to ensure that barren-ground caribou continue to use their ranges and remain an important aspect of the lives of NWT residents.
- Public education will be necessary to promote respect for caribou and awareness of traditional Aboriginal practices so all NWT residents know how to contribute to the recovery of caribou.
- Management will be consistent with settled land claim agreements and will recognize Aboriginal harvesting rights in areas with and without settled land claims.
- Decisions will be made based on recommendations from, and in consultation with, co-management partners and Aboriginal governments.
- NWT residents will have the opportunity for meaningful input and participation in barren-ground caribou management.
- Conservation practices will take into account local and traditional knowledge and values as well as information collected by research institutions, governments and other agencies.
- Management will be guided by the Precautionary Principle, in which information gaps or uncertainty will not delay the implementation of actions necessary for the recovery of caribou herds.
- Adaptive management will be used to determine the effectiveness of management actions on recovering and sustaining herds.

Background

Fluctuations in Numbers

Traditional knowledge and scientific evidence indicate that barren-ground caribou numbers in the NWT naturally fluctuate over regular intervals. This interval or cycle lasts about 30 years for some herds, but may be longer for other herds. These cycles coincide with long-term regular fluctuations in climatic patterns. These natural cycles must be considered when developing management actions.

The social, cultural and economic value of barren-ground caribou to residents of the NWT is immense. When caribou numbers declined in the past, people experienced hardships and relied on other food sources like moose and fish. Aboriginal elders talk about times when there were not enough caribou to feed everyone. Caribou numbers will continue to fluctuate over time. NWT residents must remember there will be times when the herds will not be large enough to meet all needs and caribou declines can still result in economic and social hardships.

Herd Status and Recent Management Actions

Barren-ground caribou populations throughout North America are designated as "herds" based on where adult females calve in June. Each herd has an identifiable, distinct calving ground. Calving grounds are defined and mapped based on satellite telemetry and aerial surveys. Nine barren-ground caribou herds spend all or a portion of their annual cycle within the NWT (Figure 1). These herds are migratory and are hunted by Dene, Inuvialuit, Métis and non-Aboriginal people from most communities in the NWT. Most NWT herds are also shared with harvesters outside of the NWT.

Caribou declines were widespread before the implementation of the 2006-2010 Strategy. The Cape Bathurst and Bluenose West herds have been stable since 2006, in large part due to harvest management actions and better calf recruitment (Table 1; Appendix C). Results from the 2010 surveys indicate the Porcupine and Bluenose East herds have increased, while the Bathurst herd may have stabilized, in part due to harvest man. gement actions and improved calf recruitment. However, other NWT herds (Tuktoyaktuk Peninsula, Beverly and Ahiak) have yet to recover.

This new Strategy focuses on actions required between 2011 and 2015 to ensure each herd recovers as quickly as possible.

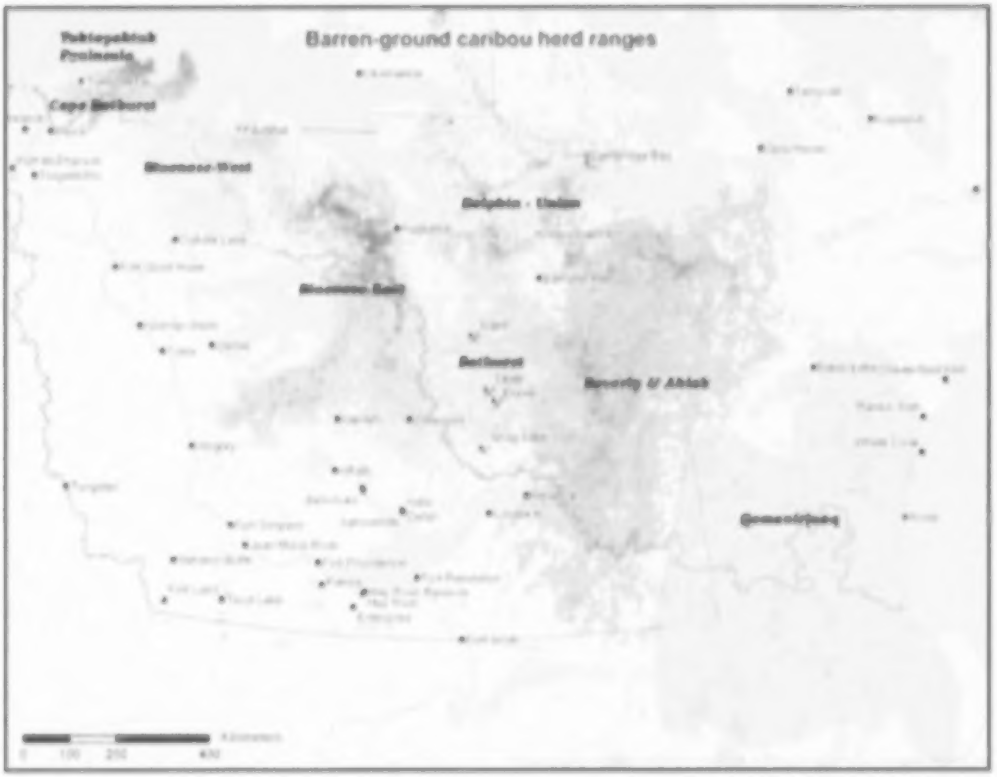


Figure 1: Northwest Territories barren-ground caribou ranges for the Tuktoyaktuk Peninsula, Cape Bathurst, Bluenose-West, Bluenose-East, Bathurst, Beverly and Ahiak herds derived from locations of satellite collared caribou between September 2005 and September 2010 (2002-2006 for Dolphin/Union). The Qamanirjuaq range was derived from survey data from 1957 to 1995 and is based on seasonal range maps developed by the Beverly Qamanirjuaq Caribou Management Board.

Table 1. Herd size, management actions taken since 2006, and trend.

Herd	Herd Size During Current Cycle		Management Actions Taken Since 2006	Trend
	High (year)[1]	Low (year)[1]		
Porcupine	178,000 (1989)	123,000 (2001)	In 2006, tags for resident hunters reduced from five (any sex) to two (male only). Harvest Management Plan (HMP) completed in June 2010. Aboriginal harvesters implementing a voluntary bulls-only harvest. All hunters are expected to report their harvest.	Increasing Population estimate for 2010 – 169,000
Tuktoyaktuk Peninsula	3,100 (2006)	2,700 (2009)	No resident, outfitted or commercial harvest since 2006. Aboriginal harvest only. Inuvialuit beneficiaries may not hunt caribou on the Tuktoyaktuk Peninsula from April 15 to June 15 to allow Cape Bathurst caribou to migrate.	Slow decline
Cape Bathurst	19,300 (1992)	1,900 (2009)	No resident, outfitted or commercial harvest since 2006. In 2007, all harvest closed.	Stable since 2006
Bluenose-West	112,300 (1992)	17,900 (2009)	No resident, outfitted or commercial harvest since 2006. Between 2007 and 2009, 4% Total Allowable Harvest implemented to reduce Aboriginal harvest. An 80% bull harvest is recommended.	Stable since 2006
Bluenose-East	104,000 (2000) Estimate based on 2010 survey: 98,600	65,100 (2006)	No resident, outfitted or commercial harvest since 2006 in the Sahtu region. In 2006, tags for resident hunters in the North Slave region reduced from five (any sex) to two (male only). In 2007, tags for outfitted hunting in the North Slave region reduced. In January 2010, all resident, outfitted and commercial hunting closed in the North Slave region.	Increasing

Herd	Herd Size During Current Cycle		Management Actions Taken Since 2006	Trend
	High (year)[1]	Low (year)[1]		
Bathurst	472,000 (1986)	32,000 (2009)	In 2006, tags for resident hunters in the North Slave region reduced from five (any sex) to two (male only). In 2007, tags for outfitted hunting in the North Slave region reduced from 1,560 to 750. In January 2010, all hunting closed on the winter range of the Bathurst herd. Limited Aboriginal harvest of 300 ± 10% established in December 2010.	Stable
Ahiak	No estimate of herd size, but calving distribution surveys conducted between 2006 and 2010.		Since 2006, tags for resident hunters reduced from five (any sex) to two (male only). In January 2010, all resident, outfitted and commercial hunting closed in the North Slave region. Co-management boards and GNWT have been advocating responsible hunting, reduction of wastage and hunting of bulls over cow-hunting.	Declining
Beverly	276,000 (1994)	Very low numbers on calving ground based on calving distribution surveys conducted in 2007, 2008, 2009 and 2010.	In 2006, tags for resident hunters reduced from five (any sex) to two (male only). In January 2010, all resident, outfitted and commercial hunting closed in the North Slave region.	Declining
Dolphin-Union	Estimated high of 100,000	Estimated at 27,000 in 1997. Results from 2007 Nunavut survey still undergoing analysis.	In 2006, tags for resident hunters reduced from five (any sex) to two (male only).	Unknown
Qamanirjuaq	345,000 (2008)	96,000 (1994)	In 2006, tags for resident hunters reduced from five (any sex) to two (male only). In January 2010, all resident, outfitted and commercial hunting closed in the North Slave region.	Slow decline

[1] Surveys began in the 1980s. High numbers are the highest population estimate recorded during the current population cycle. Low numbers are the lowest recorded population estimate

Establishing Herd Status

Periodic estimates of herd size are essential for management. For barren-ground caribou herds, population size is estimated using calving ground and/or post-calving photo-census surveys undertaken in summer. Both methods take advantage of a period in the annual cycle when caribou group together. During winter, herd ranges have some overlap with neighbouring herds.

Calving ground surveys are conducted in June. At calving, almost all pregnant cows in one herd are in the same area. Few bulls, yearlings and non-pregnant cows are on the calving grounds. During a calving photo survey, the number of breeding cows on the calving ground is estimated using aerial photography. The number of breeding cows can be used to calculate total herd size by including bulls, based on estimated sex ratio during the fall breeding season, and by including non-pregnant cows, based on estimated herd-wide pregnancy rate.

Post-calving ground photo-census surveys provide another estimate of herd size. These surveys are carried out in early to mid-July, when caribou from one herd (all sex and age classes) may form large, compact groups of hundreds or thousands in response to warm temperatures and insect harassment. These tightly grouped caribou can be located using an adequate number of satellite collars and are photographed from small planes. Caribou on the photos are then counted.

Comparing calving and/or post-calving ground estimates to previous estimates determines whether the trend of a herd is stable, decreasing or increasing (see Table 1 for current trends of NWT herds). A comparison of the two techniques was undertaken in 2010 for the Bluenose-East herd. Both surveys yielded similar herd estimates (about 100,000 caribou).

A third method may also be used to estimate trend. This is called a calving ground reconnaissance survey. These surveys involve flying transects spaced 10 km apart across the entire calving ground in June. Observers in small planes count the caribou observed within the transect. Counts from one year are then compared to counts from previous years to assess trends. This method has been used since 2006 to track trends on the Ahiak and Beverly calving grounds.

Additional information may also be collected by biologists, harvesters and elders to assess trend:

- the survival of adult females and calves;
- fall condition;
- pregnancy rates;
- disturbance during calving or other sensitive seasons;
- effects of land use activities;
- range condition;
- trends in harvest levels;
- harvest sex ratio; and
- predator abundance.

This information helps wildlife managers identify possible reasons for caribou declines and increases, understand the potential impacts of key factors, and decide on monitoring and management actions.

Shared Management

Management of barren-ground caribou in the NWT is a collaborative process with governments, co-management boards, Aboriginal governments and organizations, and communities located on the ranges of herds working together.

Inter-jurisdictional Management – Seven NWT barren-ground caribou herds are shared with neighbouring jurisdictions (Table 2).

Co-management Boards – Co-management processes have been established under land claim agreements in the Inuvialuit, Gwich'in, Sahtu and Tłı̨chǫ settlement areas to provide direction and advice to governments on management of caribou and their habitat using traditional and scientific knowledge. These boards are: Wildlife Management Advisory Council (NWT) (WMAC-NWT) (Inuvialuit); Gwich'in Renewable Resources Board (GRRB) (Gwich'in); Sahtu Renewable Resources Board (SRRB) (Sahtu); and Wek'èezhìi Renewable Resources Board (WRRB) (Tłı̨chǫ).

Caribou Management Boards – Three caribou management boards have been established through inter-jurisdictional agreements. The Porcupine Caribou Management Board (PCMB), with representation from Alaska, Yukon and NWT governments and communities, advises governments and communities on monitoring and management of this international herd. The International Porcupine Caribou Board (IPCB) has representatives from Canada and the United States, and provides advice on those aspects of the conservation of the Porcupine herd and its habitat requiring international coordination, cooperation and communication. The Beverly and Qamanirjuaq Caribou Management Board (BQCMB), with representation from Nunavut, NWT, Saskatchewan and Manitoba governments and communities, advises on monitoring and management of these two herds.

Table 2. Shared Management of NWT barren-ground caribou herds.

Shared Herd	Governments	Boards Established Through Land Claim Agreements	Boards Established Through Inter-jurisdictional Agreements
Porcupine	Yukon, NWT, Canada, United States (Alaska), Gwich'in Tribal Council, Inuvialuit Game Council	Wildlife Management Advisory Council (NWT), Gwich'in Renewable Resource Board	Porcupine Caribou Management Board, International Porcupine Caribou Board
Tuktoyaktuk Peninsula	NWT, Canada	Wildlife Management Advisory Council (NWT)	
Cape Bathurst	NWT, Canada	Wildlife Management Advisory Council (NWT), Gwich'in Renewable Resources Board	
Bluenose-West	NWT, Canada	Wildlife Management Advisory Council (NWT), Gwich'in Renewable Resources Board, Sahtu Renewable Resources Board, Nunavut Wildlife Management Board	
Bluenose-East	NWT, Nunavut, Canada, Tłı̨chǫ	Wildlife Management Advisory Council (NWT), Sahtu Renewable Resources Board, Wek'èezhìi Renewable Resources Board, Nunavut Wildlife Management Board	
Bathurst	NWT, Nunavut, Canada, Tłı̨chǫ	Wek'èezhìi Renewable Resources Board, Nunavut Wildlife Management Board	
Dolphin Union	NWT, Nunavut, Canada	Wildlife Management Advisory Council (NWT), Nunavut Wildlife Management Board	
Beverly and Ahiak	Nunavut, NWT, Tłı̨chǫ, Saskatchewan, Canada	Wek'èezhìi Renewable Resources Board (Ahiak), Nunavut Wildlife Management Board	Beverly and Qamanirjuaq Caribou Management Board (Beverly)
Qamanirjuaq	Nunavut, NWT, Saskatchewan, Manitoba	Nunavut Wildlife Management Board	Beverly and Qamanirjuaq Caribou Management Board

Key Factors Affecting Caribou

Many factors can affect the size and trend of NWT herds. Factors that can be managed include predators, harvest levels, land use activities and forest fires. Other factors – such as disease and weather also affect caribou, but cannot be managed. As these factors differ among herds, it is important to manage each herd separately.

Predators

- Wolves, grizzly bears and wolverines affect survival of adult and calf caribou.
- Wolves are the most important year-round predators of barren-ground caribou. Annual surveys suggest wolf numbers have declined in the Bathurst herd's range.
- Bears are much fewer in number and only prey on caribou in spring, summer and fall. Harvesters have reported seeing more grizzly bears in recent years.

Harvest

- When herd numbers are low, the level of harvest can affect the ability of the herd to recover.

Land Use Activities: Mining, Oil and Gas and Cumulative Effects:

- Impacts of mining and exploration include avoidance of active mine sites, disturbance when feeding or resting, feeding in contaminated sites and disturbance from low flying aircraft.

Land Use Activities: Roads

- All NWT herds except the Dolphin/Union herd have winter or all-weather roads on their ranges.
- Impacts include disturbance of movements because of traffic, collisions with vehicles and increased access for harvesters, who traditionally did not harvest in more remote areas.

Forest Fires

- In the boreal forest, forest fire renews the forest and is a normal part of the ecosystem. Caribou will eat new grasses in newly burned forests, but tend to avoid large burned areas.
- Impacts of fires on caribou include destruction of lichen, an important winter food that can take decades to recover, and changes in movement patterns as caribou look for better areas to feed.

Disease and Contaminants

- Disease can affect caribou numbers and condition. All wild animals have parasites and other diseases, which may affect reproduction and survival.
- Contaminants can also affect caribou health and condition. Caribou are monitored for the presence and concentration of contaminants (e.g. heavy metals like cadmium and mercury, and various chemicals used as pesticides and herbicides).
- Based on monitoring undertaken, disease and contaminants are not currently major factors affecting herds.

Climate

- Spring and summer weather can affect vegetation quality, which influences calf growth and adult condition. In hot, dry summers, abundant insects may interfere with caribou feeding, resulting in poor physical condition and lower pregnancy rates in female caribou.
- If snow is deep on winter ranges or there are ice layers, it takes more energy for caribou to dig for lichen and grasses to eat. They may also travel further in search of better feeding conditions.

Our Challenges

The challenges for managing caribou are current herd sizes, changes in human activities, inter-jurisdictional management, fluctuating environments, consultation and capacity and common understanding of caribou trends.

Current Herd Size

Most NWT caribou herds are in the low part of their cycle. It will take time for these herds to recover. We must maintain management actions to help natural recovery.

Changes in How People Hunt Caribou

Technology has changed the way people hunt barren-ground caribou and keep meat. Previously, caribou were only hunted in certain seasons and it took several days to reach caribou using dog teams, canoes or small snow machines. Hunters could not take more than five or six caribou in a load and there were no freezers to keep meat year round. When caribou numbers were low in the 1960s and 1970s, few people could find caribou and hunting naturally declined as people relied on other sources of country food.

Now, freezers are common place and people have grown accustomed to eating caribou year round. Most hunting occurs along roads and is done using trucks or fast snowmobiles. Most fall hunts now use aircraft to access caribou. For some NWT herds, access in the 1990s and 2000s did not decrease as herds became smaller because hunters could easily access caribou through the use of trucks, high-powered skidoos and aircraft. Information from satellite radio collars increased their ability to find the caribou.

Cumulative Effects: Land Use Activities in Caribou Range

Resource exploration and development has varied in extent and location during the past 50 years. In addition to several operating gold and diamond mines, there are several gold, lead, zinc and diamond deposits on caribou winter and summer range in the final phases of exploration or the environmental assessment process. Mineral exploration is likely to increase again on the Canadian Shield. Oil and gas activities on caribou winter range in the Mackenzie Delta and Valley will increase if the Mackenzie Gas Project proceeds. All these activities may impact movements of caribou and possibly lead to avoidance of areas.

Road access has also increased on barren-ground caribou range. This includes the completion of the Dempster Highway in 1979, improvements to winter roads to communities, winter roads to mines in the North Slave region and the proposed all-weather road from Inuvik to Tuktoyaktuk. Road access may affect caribou migration patterns and increase harvester access to caribou. Some tourism and outfitting lodges are along caribou migration routes, including water crossings.

The NWT is an attractive destination for people seeking a unique recreational experience. In the 1980s tourism and outfitting lodges on barren-ground caribou summer range were established. Some tourism and outfitting lodges are along caribou migration routes.

Collaborative Management

Collection of information for management and development of management plans needs to be done in collaboration with partners and involve all stakeholders. Management planning must use all sources of information, including traditional and local knowledge and scientific information. Implementing management plans and developing research and monitoring plans also need to be done in collaboration with partners.

Several herds (Bluenose-East, Bathurst, Dolphin-Union and Beverly and Ahiak) have calving grounds in Nunavut. Caribou from some of these herds also travel to northern Saskatchewan during the winter season. The Porcupine herd's range is primarily in Yukon and Alaska. Monitoring programs have been cost-shared with these jurisdictions. ENR will continue to work to improve joint research, monitoring and management with neighbouring jurisdictions.

Fluctuating Environments

Barren-ground caribou are a part of a constantly changing environment. While fluctuations in climate that occur over decades can affect changes in herd size at a sub-continental scale, other environmental influences are highly variable. Local weather conditions, forest fires, predation rates and insect abundance are highly unpredictable. There is also high degree of uncertainty about the future effects of climate change on barren-ground caribou and their habitat.

Consultation and Public Engagement

The Strategy's success depends on public support. There is a diversity of views in the NWT about caribou status, monitoring and management. Implementing this Strategy and management actions requires consultation, engagement and information exchange with the many groups of people involved with caribou in the NWT. Consultation and engagement takes time and requires financial and human investment by management agencies, co-management partners, and Aboriginal governments and organizations.

Capacity

Resources for Monitoring and Management Activities – The capacity of GNWT, co-management partners, Aboriginal governments and organizations, and other agencies to monitor the status of herds, predators, the physical environment, harvest levels and human activity is dependent on adequate financial and human resources. Using current technology to monitor the herds and key factors is very costly.

Common Understanding of Caribou Trends

Another challenge is ensuring everyone has current and accurate knowledge to determine herd status and trend, and decide on appropriate monitoring and management actions.

The 2011-2015 NWT Barren-ground Caribou Strategy

Our long-term vision is to ensure caribou remain to sustain present and future generations of NWT residents forever. The overall goal is to maintain numbers of each caribou herd within their natural range of variation. To achieve this goal, this Strategy focuses on five objectives similar to those of the previous Strategy:

- To engage co-management partners in monitoring and management of caribou.
- To ensure that appropriate, up-to-date information is available for management decisions.
- To manage impacts of key factors affecting caribou that are within our control.
- To inform the public about the status of caribou and about their role in management.
- To maximize benefits from caribou to NWT residents.

Key strategies are identified under each component. The actions needed to implement and achieve the goals of this Strategy during the next five years (2011-2015) are outlined in Appendix C: Detailed Strategies.

The public review identified the following priority actions under the strategies:

- Complete management plans and inter-jurisdictional agreements.
- Increase capacity for involvement by Aboriginal governments.
- Monitor effects of predators and harvest.
- Monitor cumulative effects and develop industry best practices.
- Manage habitat in relation to forest fires and land use activities.
- Promote traditional practices and hunter education.

1. Engaging all Partners

The status and management of caribou is of interest to everyone who uses the NWT herds, including people outside of the NWT. Engagement of partners with a common interest in caribou conservation is necessary for management and recovery actions to succeed.

Management plans are critical. Management planning and implementation includes consultation and public engagement with communities, Aboriginal governments and organizations, and stakeholders such as resident hunters, industry, tourism operators and environmental non-government organizations. Land managers also influence caribou habitat management. An integral part of this process is capacity building, which is necessary for Aboriginal governments to be fully involved in management, research and monitoring activities where required under land claims agreements

Coordination and collaboration with management partners is also necessary. For example, Nunavut has developed a Nunavut Caribou Strategy Framework. Co-management boards have been established in areas with settled land claims and a collaborative approach to monitoring and management has been initiated with jurisdictions that share herds with the NWT. Inter-jurisdictional caribou management boards have been established for some transboundary herds (Porcupine, Beverly and Qamanirjuaq herds) and information is exchanged with other circumpolar nations interested in caribou conservation.

Strategies

1. Complete and implement management plans and agreements to promote recovery of herds and conserve habitat.
2. Complete inter-jurisdictional agreements, where needed, to ensure a coordinated and cooperative approach to the management and monitoring of shared herds.
3. Enhance and promote the exchange of traditional knowledge and scientific information on the status and use of caribou across the circumpolar north.

2. Information for Herd Management

Traditional and local knowledge and scientific information is required to assess herd trends, understand the factors that drive caribou trends, determine the effectiveness of management actions on herds and predict how herds will change in the future. To effectively manage herds, regular information is needed on:

- caribou herd size (abundance and trend);
- calf and cow survival;
- sex ratio;
- caribou health and condition (e.g. presence of disease, contaminants and parasites);
- caribou movements and distribution; and
- environmental conditions like insect abundance, climate change and forest fires.

Management plans will recommend frequency of surveys and other monitoring.

Strategies

4. Continue to monitor all NWT caribou herds and update or develop caribou population models using current information.
5. Continue to identify, support and implement studies necessary to understand the effect of environmental conditions on caribou populations.

3. Managing Impacts of Key Factors

Caribou herds usually decline when the survival of calves and cows is low and/or if pregnancy rates are low. Harvest, predation, land use activities and forest fires are key factors that can affect survival and pregnancy rates can potentially be managed. Actions should also consider the cumulative impacts of these key factors. Actions to recover caribou should recognize the long-standing relationship between Aboriginal cultures and caribou and respect Aboriginal cultural and traditional practices.

Management actions should be reviewed regularly and modified as new information is received and evaluated. This is known as "adaptive management". Information from other research and monitoring programs will be used to determine the effect of caribou management actions on other species.

Strategies

6. Monitor the effectiveness of management actions to reduce harvest and predation of caribou.
7. Assess cumulative impacts of land use activities and natural factors on caribou habitat and develop best management practices to mitigate and minimize these impacts in the NWT.

4. Public Education and Compliance

Everyone has a role to play in the recovery of NWT barren-ground caribou herds. Public education programs promote respect for caribou and ensure NWT residents understand the status of caribou herds and the measures necessary for herd recovery and growth, including regulations. Promoting hunting excellence can reduce wounding losses and prevent meat wastage. Enhanced compliance (more frequent patrols and monitoring of key hunting areas) has been requested by the public.

Strategies

8. Develop and implement a public information and hunter education program to share information on caribou herds and promote hunter excellence.
9. Document and support community-based hunting rules and traditional laws and practices to promote respect for caribou.
10. Continue enhanced compliance actions, including collaborative programs with Aboriginal governments.

5. Maximizing Benefits

For many NWT residents, harvesting caribou is a way of life that links directly to their livelihood, culture and well-being. In small communities and for low income families, harvesting caribou and other wild foods is essential for meeting basic nutritional needs where store-bought foods are prohibitively expensive and cash is scarce.

Certain economic activities such as barren-ground caribou outfitting, commercial meat production and ecotourism also rely on caribou. NWT companies have significant investments in such activities, which have provided employment for NWT residents.

When caribou numbers are high, socio-economic benefits can be maximized. However, when numbers are low, both social and economic hardships are created.

As caribou herds recover during the next five years, hardships must continue to be addressed.

Strategies

11. Continue to work with the Department of Industry, Tourism and Investment and Aboriginal governments to support access to alternate country foods (fish, moose, bison and musk ox) and meat sources and to promote alternate harvesting opportunities.
12. Work with the Department of Industry, Tourism and Investment and commercial ventures to address impacts to businesses.

Annual Reporting on Strategy

An annual report of actions undertaken in the Strategy will be made available to co-management partners and the public.

Financial Summary

Appendix B provides a summary of the investment required for each of the proposed strategies during the next five years.

The 2011-2015 Strategy identifies the need for a total investment of $19 million over five years to achieve the vision and goal of sustaining barren-ground caribou for current and future generations. This would require new investments of $11.3 million over five years. Implementation will depend on funding available annually from appropriations granted by the Legislative Assembly.

The major new investments in the 2011-2015 Strategy relate to the collection of information necessary for making sound management decisions, consultation with Aboriginal partners, and public education and compliance. Significant resources are needed to ensure NWT residents are fully aware of caribou management issues and have opportunities for input into management decisions. It is anticipated that some of this additional investment will come from co-management partners.

Funding sources for implementation of some components of the Strategy may include the wildlife co-management boards, federal government, non-government organizations and industry. For example, funds from Aboriginal Affairs and Northern Development Canada have helped pay for cumulative effects studies and workshops, and industry has contributed to the costs of monitoring caribou movements.

Conclusion

The recovery of the NWT's barren-ground caribou herds is important to everyone in the NWT. All NWT residents can contribute to recovery. The GNWT, Aboriginal governments and co-management boards accept a leadership role in the co-operative management of our barren-ground caribou herds. By implementing this Strategy, the GNWT will build on, and enhance, its strong working relationships with co-management boards, Aboriginal governments and organizations, communities, monitoring agencies, other government agencies and caribou user groups so that:

- Management decisions are based on sound information and principles of conservation;
- Management decisions have broad public understanding and support;
- Hardships felt by residents as a result of low caribou numbers are addressed;
- Key factors affecting caribou herds are identified, monitored and managed using adaptive management; and
- NWT barren-ground caribou herds have an opportunity to recover and grow to a size where all needs can be met and all benefits can be maximized.

Appendix A
Detailed Strategies

Strategy #1 – Complete and implement management plans and agreements to promote recovery of herds and conserve habitat.

Wildlife conservation is the mandate of the GNWT and a primary objective of NWT land claims agreements and NWT residents. Management plans have been initiated for some herds and need to be completed and implemented in collaboration with Aboriginal governments, co-management boards, which have a key role to play in wildlife management in land claim settlement areas, and users. Management plans also need to be developed for other herds. Plans set out objectives for caribou conservation and management. Actions supporting this strategy are:

- Complete management plans – To complete plans, funding is required: for extensive consultation and public engagement with wildlife co-management boards, land managers, Aboriginal governments and organizations, resident hunters, outfitters and other stakeholders to establish a common understanding of conservation principles and conservation objectives for barren-ground caribou; to identify threats to conservation for each herd; to identify important caribou habitat; and to determine how to best apply conservation measures.
  - Complete management plan for the Cape Bathurst, Bluenose-West and Bluenose-East caribou herds – The draft plan is being updated in collaboration with WMAC (NWT), GRRB, SRRB, WRRB, Nunavut Wildlife Management Board and the Tuktut Nogait National Park Management Board. **Timeline: Fall 2011**.
  - Complete range management plans for the Cape Bathurst and Bluenose-West herds in relation to the Mackenzie Gas Project. Range management plans are one component of a management plan. **Timeline: Winter 2012.**
  - Develop and complete long-term management plans for the Bathurst and Ahiak herds and update the plan for the Beverly and Qamanirjuaq herds. **Timeline: 2012 (Bathurst herd) and 2014 (Beverly, Ahiak and Qamanirjuaq herds).**

Complete/Update Management Plans	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Cape Bathurst	125,000	50,000			
Bluenose-West					
Bluenose-East					
Bathurst		200,000 NEW	200,000 NEW		
Beverly, Ahiak and Qamanirjuaq			200,000 NEW	200,000 NEW	
Total	$125,000	$250,000	$400,000	$200,000	$0

- Implement management plans (see also Strategies 8, 9 and 10):
  - The Porcupine Harvest Management Plan (HMP) was signed in 2010 and an implementation plan was completed in early 2011. GNWT will need to fund activities associated with plan implementation, including harvest monitoring (check stations and harvest interviews), condition sampling and a public education program. **Timeline: 2011 and ongoing**.
  - Management plan for the Cape Bathurst, Bluenose-West and Bluenose-East caribou herds – GNWT will need to fund activities associated with plan implementation, including harvest monitoring and a public education program. **Timeline: 2012 and ongoing**.
  - Implementation of Bathurst and Beverly, Ahiak and Qamanirjuaq management plans. **Timeline: 2014 and ongoing**.
- Implement caribou management agreements with Aboriginal governments and develop capacity for Aboriginal involvement. Aboriginal governments do not have the capacity to be involved in caribou management where required in land claims agreements. Funding will be used for coordinators, joint committees for undertaking joint management and monitoring actions, working with hunters and facilitating participation in workshops on caribou management and monitoring. **Timeline: Ongoing**.
- Support caribou management boards on which GNWT is a member through annual contributions. Contributions are for commitments made in agreements between the GNWT and the boards. **Timeline: Ongoing**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Capacity Building	300,000 NEW	300,000 NEW	300,000 NEW	300,000 NEW	300,000 NEW
Board Contributions	93,000	93,000	93,000	93,000	93,000
Total	$393,000	$393,000	$393,000	$393,000	$393,000

- Promote use of tools that can be used to conserve important caribou habitat (e.g. calving grounds and key wintering areas).
  - Through the NWT Protected Areas Strategy (PAS), complete designation of candidate areas that protect caribou habitat (funded through PAS). **Timeline: 2015**.
  - Promote land use planning in land claim and non-settled land claim areas to conserve caribou habitat (funded outside GNWT). **Timeline: Ongoing**.

Payback and Results

- ✓ Management plans will be completed to identify monitoring and management actions for each herd and roles for all partners.
- ✓ Involvement in joint management and monitoring will be increased.
- ✓ Public and caribou user groups will be aware of their role in conserving caribou and involved in developing management plans.
- ✓ Important caribou habitat (e.g. calving grounds) will be identified and conserved.

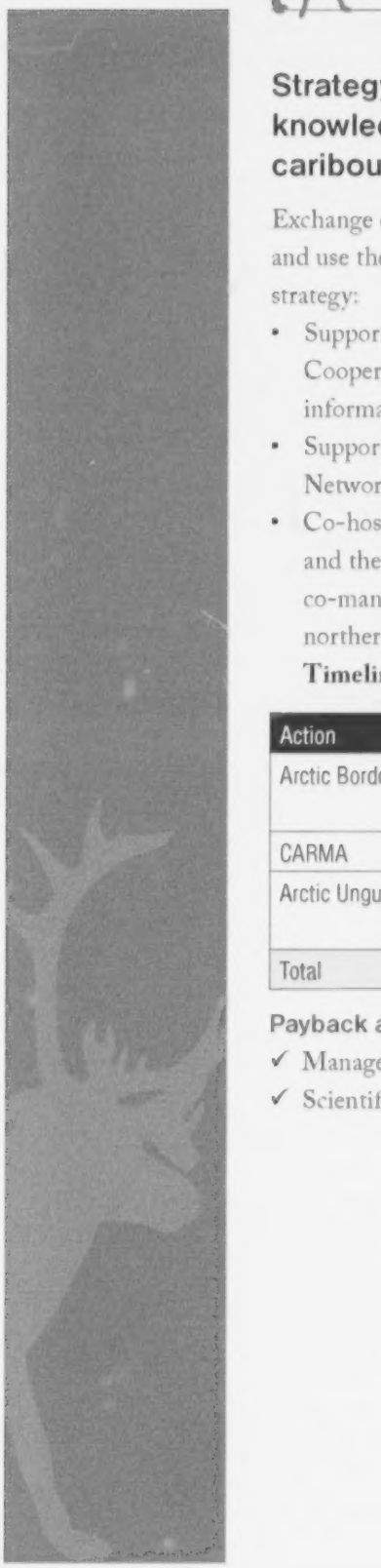
Strategy #2: Complete inter-jurisdictional agreements, where needed, to ensure a coordinated and cooperative approach to the management and monitoring of shared herds.

We need to work co-operatively with other jurisdictions to effectively manage shared herds. Actions supporting this strategy:

- Complete inter-jurisdictional agreements with Nunavut, Saskatchewan and the Yukon to develop work plans and budgets for the joint management and monitoring of shared herds. Work plans will provide details on monitoring, cost sharing and processes for developing management actions for shared herds. Plans will be reviewed annually by all partners. **Timeline: Fall 2012**.

Payback and Results

- ✓ Inter-jurisdictional agreements will be completed to improve planning and coordination, cost sharing and effective use of limited resources.
- ✓ Methods of collecting harvest data will be consistent across jurisdictions.



Strategy #3: Enhance and promote the exchange of traditional knowledge and scientific information on the status and use of caribou across the circumpolar north.

Exchange of information helps ensure management and conservation approaches are current and use the best available traditional, local and scientific knowledge. Actions supporting this strategy:

- Support, participate in and expand the Arctic Borderlands Ecological Knowledge Cooperative to allow communities to become involved in sharing traditional knowledge information on the Porcupine caribou herd and range. **Timeline: Ongoing**.
- Support and participate in the Circum Arctic Rangifer Monitoring and Assessment Network (CARMA). **Timeline: Ongoing**.
- Co-host the 2011 International Arctic Ungulate Conference (AUC) with Nunavut and the Yukon. This conference will provide wildlife managers, Aboriginal groups, co-management partners, researchers and biologists with the opportunity to discuss northern ungulate management, key research and monitoring priorities. **Timeline: August 2011**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Arctic Borderlands	40,000	40,000	40,000	40,000	40,000
CARMA	10,000	10,000	10,000	10,000	10,000
Arctic Ungulate Conference	40,000	360,000 NEW	5,000 NEW	0	0
Total	$90,000	$410,000	$55,000	$50,000	$50,000

Payback and Results

- ✓ Management of shared herds is based on the best available information.
- ✓ Scientific information is collected using the most current techniques.

Strategy #4: Continue to monitor all NWT caribou herds and update or develop caribou population models using current information.

A minimum level of monitoring is necessary at all times during a herd's natural cycle of abundance to examine impacts of human activities and natural factors on the herd. The following actions will provide information necessary to determine where a caribou herd is within its long-term population cycle. Actions supporting this strategy:

- As part of the management planning process, design and implement a monitoring program that measures multiple demographic indicators (Tables 3 and 4). This program will include community-based monitoring approaches to encourage harvesters to collect information on health (including disease), condition and pregnancy rates.
  Timeline: Ongoing to Winter 2015.
- Monitor the seasonal distribution and movements of herds annually using satellite collars.
  Timeline: Ongoing.

Table 4. Types of barren-ground caribou surveys conducted in NWT.

Information/Survey Type	Rationale
Population size – calving or post-calving photo-census survey	Boards and public focus on herd size. Used to track trends. Critical for management decisions.
Over winter calf survival – spring (March) recruitment survey (calf:cow ratios)	Used to track trends between population surveys. Spring calf:cow ratios below 20:100 are associated with declining herds, while higher values are indicative of stable or increasing herds.
Fall sex ratio (bull:cow ratios)	Needed to estimate total herd size if population size is based on a calving photo survey. Also used to monitor change in herd sex ratio due to harvest.
Calving ground reconnaissance survey	Defines calving grounds based on location of collared females. Information on cows collected during survey used as an index of breeding cow numbers, which is used to track herd trend between population surveys.
June calving composition – calving ground survey	Used to estimate pregnancy rate and establish calving grounds.
Condition, health, and pregnancy – community/ hunter	Local assessment of condition, health and pregnancy rates. Involves harvesters and communities in monitoring program.
Movements – satellite collar data	To track location of caribou for surveys, determine rates of movement between herds and document range use.

Table 5. Survey type and cost for 2011-2015.

Herd/Survey	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Porcupine					
Monitoring undertaken by Yukon and Alaska (GNWT contributes to monitoring program like monitoring of movement).	50,000	50,000	55,000	55,000	55,000
Tuktoyaktuk Peninsula					
Replace collars[1]		116,000			
Population size			40,000		
Over winter calf survival	20,000	20,000	25,000	25,000	
Fall adult sex ratio[2]				30,000	
Calving ground reconnaissance survey			15,000		20,000
Condition, pregnancy and health	15,000	15,000	15,000	15,000	15,000
Cape Bathurst					
Replace collars		116,000			
Population size			60,000		
Over winter calf survival	30,000	30,000	35,000	35,000	
Fall sex ratio				45,000	
Calving ground reconnaissance survey			50,000		55,000
Condition, pregnancy and health	15,000	15,000	15,000	15,000	15,000
Bluenose-West					
Replace collars and monitor movements (including movements of Tuktoyaktuk Peninsula and Cape Bathurst caribou)	200,000	522,000	200,000	200,000	200,000
Population size			120,000		
Over winter calf survival	40,000	40,000	45,000	45,000	
Fall adult sex ratio		50,000		60,000	
Calving ground reconnaissance survey			55,000		60,000
Condition, pregnancy and health	10,000	10,000	10,000	10,000	10,000

Herd/Survey	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Bluenose-East					
Replace collars and monitor movements	110,000	312,000	80,000	80,000	80,000
Population size	400,000[1]		200,000		
Over winter calf survival	40,000	40,000	45,000	45,000	
Fall adult sex ratio		50,000		55,000	
Calving ground reconnaissance survey			55,000		60,000
Condition, pregnancy and health	15,000	15,000	15,000	15,000	15,000
Bathurst					
Replace collars and monitor movements	80,000	133,000	118,000	60,000	60,000
Population size			350,000		
Over winter calf survival	45,000	45,000	50,000	50,000	55,000
Fall adult sex ratio		50,000	55,000		
Calving ground reconnaissance survey	84,000	70,000		70,000	75,000
Condition, pregnancy and health	15,000	15,000	20,000	20,000	20,000
Beverly and Ahiak					
Replace collars and monitor movements	50,000	206,000	50,000	50,000	50,000
Population survey		50,000[4]			
Over winter calf survival	80,000	80,000	80,000	80,000	
Fall adult sex ratio		100,000		100,000	
Calving ground reconnaissance survey, including survey of traditional Beverly calving ground	275,000				315,000
Condition, pregnancy and health	15,000	15,000	15,000	15,000	15,000
Qamanirjuaq					
Monitoring undertaken by Nunavut					
Dolphin/Union					
Monitoring undertaken by Nunavut					
Total	$1,589,000	$2,165,000	$1,873,000	$1,175,000	$1,175,000

[1] Includes costs to purchase and deploy collars. Collars are used to monitor movements.
[2] Fall sex ratio survey follows photo-census survey.
[3] Calving and post-calving survey conducted in same year to compare results from different survey techniques.
[4] Does not include $850,000 contributed by the Government of Nunavut, which is leading the survey.

- Every five years, conduct a statistical review of survey results and methods (current review ongoing; next review in 2015-2016). This includes statistical analysis and workshops to determine how often surveys should be conducted based on herd status and trend and how many collars should be deployed in each herd to track movements. **Timeline: Ongoing**.

Review of Survey Methods	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Reviews	65,000	40,000			
Workshops		50,000			
Total	$65,000	$90,000	$0	$0	$0

- Develop caribou population models that incorporate demographic data from monitoring programs and information on environmental conditions and key factors (also see Strategies 6 and 7). This includes contractor costs for statistical analyses. **Timeline: Ongoing – Winter 2015**.

Herd	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Porcupine		20,000			
Bluenose-East		70,000 NEW	30,000 NEW		
Bathurst			30,000 NEW		
Beverly and Ahiak				30,000 NEW	
Total	$0	$90,000	$60,000	$30,000	$0

Payback and Results

- ✓ Monitoring programs are credible and cost effective.
- ✓ Management of shared herds is based on the best available information.
- ✓ Users will be involved in monitoring activities.

Strategy #5: Continue to identify, support and implement studies necessary to understand the effect of environmental conditions on caribou populations.

Forest fires, insect abundance, weather and climate change are environmental factors that can affect caribou ecology and numbers. Information on environmental factors comes from traditional knowledge, local knowledge and scientific sources, and can be incorporated into cumulative effects and population models (see Strategy 4). Actions supporting this strategy:

- Monitor seasonal variation in range conditions using remote sensing approaches such as Normalized Difference Vegetation Index (NDVI). **Timeline: Ongoing**.
- Maintain and establish additional partnerships with academic institutions to address key research priorities (e.g. research priorities identified at the 2011 International Arctic Ungulate Conference). **Timeline: Ongoing**.
- Support scientific and traditional knowledge projects that investigate the effects of forest fire, climate change, insect abundance, seasonal weather and range condition on barren-ground caribou herds. **Timeline: Winter 2015**.
- Develop range management plans for herds using resource selection function models (RSFs). RSFs are created using habitat information, satellite telemetry data and other information on caribou locations. RSFs can be used to identify which habitats are important to caribou and, consequently, which habitats should be conserved by land use plans or other approaches (e.g. Bluenose-West and Cape Bathurst range management plans for barren-ground caribou in the Mackenzie Gas Project area). Range management plans would be a component of larger management plans). **Timeline: Winter 2015**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Establish partnerships to support scientific and traditional knowledge studies	40,000	40,000	40,000	40,000	40,000
Resource selection functions	0	5,000	5,000	0	0
Total	$40,000	$45,000	$45,000	$40,000	$40,000

Payback and Results

- ✓ Range management plans will be completed for regions where significant land use activities are forecast to occur.
- ✓ Environmental information will be collected to identify and protect important caribou habitat.

Strategy #6: Monitor the effectiveness of management actions related to harvest and predation of caribou.

Specific management actions related to harvest and predators will depend on herd-specific management plans. These plans will follow an adaptive management approach, which means, as required, actions will be modified as new information is received and evaluated. Determining the effectiveness of the actions requires monitoring of harvest and predation activities. Actions supporting this strategy:

- Obtain estimates of harvest levels and locations and develop common methods and approaches across the NWT. Information will come from winter road check stations, community hunts and harvest studies (e.g. resident hunter questionnaires, household interviews). **Timeline: Ongoing**.
- Compare herd distribution and harvest locations to accurately identify the proportion of the harvest that is from each herd (also see Strategy #4). **Timeline: Ongoing**.
- Determine wolf abundance and trends, and response to predator management (wolf den surveys, wolf movement study, carcass collection). **Timeline: Ongoing – Winter 2015**.
- Monitor other ungulates (moose, bison, woodland caribou and musk ox) to determine effect of reduced caribou harvest and predator management on other species. Funding for these projects is identified in GNWT business planning processes. **Timeline: Ongoing – Winter 2015**.
- Incorporate harvest and predator information into caribou population models to project the impact of various harvest and predation levels on herds (see Strategy #4). **Timeline: Ongoing**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Winter road check stations	160,000	160,000	160,000	160,000	160,000
Harvest studies	75,000 NEW	75,000 NEW	75,000 NEW	75,000 NEW	75,000 NEW
Monitor wolf abundance and distribution using den surveys	50,000	50,000	50,000	50,000	50,000
Wolf predation project		80,000 NEW	100,000 NEW	100,000 NEW	100,000 NEW
Wolf carcass collection	95,000	70,000	70,000	45,000	45,000
Total	$380,000	$435,000	$455,000	$430,000	$430,000

Payback and Results

- ✓ Caribou and predator harvest levels will be documented.
- ✓ Management actions related to harvest, predators and other ungulates are revised as required based on current information.

Strategy #7: Assess cumulative impacts of land use activities and natural factors on caribou habitat and develop best management practices to mitigate and minimize these impacts in the NWT.

Minimizing the effects of development on caribou includes the identification and implementation of best management practices. Assessing the cumulative impacts of land use activities and natural factors (like forest fires) on caribou and caribou habitat requires integration of multiple sources of information and cumulative effects modeling. Actions supporting this strategy:

- Review current and proposed wildlife effects monitoring programs established for diamond exploration and mining activities. **Timeline: Ongoing**.
- Develop best management practices for barren-ground caribou in relation to land use activities with the involvement of industry, co-management boards and other agencies. **Timeline: Ongoing**.
- Establish wildlife effects monitoring programs for current and proposed oil and gas exploration and development activities, including the Inuvik to Tuk highway and the Mackenzie Gas Project (based on current information on caribou response to disturbance). **Timeline: Ongoing**.
- Model individual and cumulative effects of natural factors and land use activities on caribou and caribou habitat by combining information from land use activities and forest fires with caribou demographic data, harvest and predation information and information on environmental conditions (e.g. climate change) (see Strategies 4, 5 and 6). This includes holding workshops with industry. **Timeline: Ongoing**.
- Work with other agencies (e.g. Aboriginal Affairs and Northern Development Canada) to track land use impacts on caribou ranges by creating a central database of land use activities in the NWT. **Timeline: Ongoing.**
- Manage forest fires in key caribou winter ranges by identifying high priority caribou habitat with communities. **Timeline: Ongoing.**

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Identify best practices	0	125,000	125,000	0	0
Cumulative effects modelling and workshops	0	175,000 NEW	0	0	0
Total	$0	$300,000	$125,000	$0	$0

Payback and Results

- ✓ Best management practices guidelines are developed to minimize land use impacts on caribou herds and their habitat.
- ✓ Individual and cumulative effects of land use activities and forest fires on caribou herds and habitat are used to develop range management plans that balance land use and caribou conservation.

Strategy #8: Develop and implement a public information and hunter education program to share information on caribou herds and promote hunter excellence.

Public education programs will facilitate understanding and acceptance of the management actions required to recover and sustain herds. Hunter education programs will enhance the value of caribou as a resource and reduce wounding of animals and wastage of meat. Actions supporting this strategy:

- Update ENR website with new information as it becomes available and expand the suite of tools for sharing public information. **Timeline: Ongoing**.
- Support school programs and outdoor education programs for youth and adults to promote sharing of information, including traditional knowledge, on caribou status and management. **Timeline: Ongoing.**
- Enhance public information materials by producing caribou fact sheets and other materials providing updates on the status of herds and conservation measures. **Timeline: Ongoing – Winter 2015**.
- Expand public education activities to promote hunting excellence to reduce wastage and wounding of caribou. Activities could include marksmanship events and training (e.g. providing harvesters with targets for sighting rifles and access to firing ranges), learning about Aboriginal values and conducting on-the-land programs to share traditional knowledge (e.g. encouraging elder/youth hunting to provide mentorship for inexperienced harvesters). Videos on traditional meat handling techniques will be developed in local languages and distributed. **Timeline: Ongoing – Winter 2015**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Update ENR web site	5,000	5,000	5,000	5,000	5,000
School and outdoor education programs	30,000	30,000	30,000	30,000	30,000
Public education program		100,000 NEW	100,000 NEW	100,000 NEW	100,000 NEW
Public education program – hunter excellence	60,000	100,000 NEW	100,000 NEW	100,000 NEW	100,000 NEW
Total	$95,000	$235,000	$235,000	$235,000	$235,000

Payback and Results

- ✓ Expanding upon existing media products and public education programs will promote improved public understanding of caribou conservation and increase acceptance of management actions.
- ✓ Expanding upon existing media products and public education programs will promote responsible hunting and reduce wastage, wounding and crippling losses.

Strategy #9: Document and support community-based hunting rules and traditional laws and practices to promote respect for caribou.

Respect for caribou will be promoted by working with Aboriginal governments and organizations to support traditional knowledge studies and traditional practices and values. Actions supporting this strategy include:

- Hunting Ethics Program – Provide funding for communities, resident harvesters and elders to share and compile information on appropriate harvesting methods showing respect for caribou. **Timeline: Ongoing**.
- Promote traditional knowledge studies. **Timeline: Ongoing**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Hunting Ethics		30,000 NEW	30,000 NEW	30,000 NEW	30,000 NEW
Traditional Knowledge Studies		75,000 NEW	75,000 NEW	75,000 NEW	75,000 NEW
Total	$0	$105,000	$105,000	$105,000	$105,000

Payback and Results

- ✓ Harvesting rules reflecting traditional values and practices are documented and shared.
- ✓ Traditional knowledge will be incorporated into caribou conservation and management actions.

Strategy #10: Continue enhanced compliance actions, including collaborative programs with Aboriginal governments.

Enhanced patrols are necessary to support management actions directed at the recovery and growth of herds that are still at low numbers. Actions supporting this strategy:

- Increase compliance with management plans by enhancing patrols in individual regions and community involvement (e.g. increase monitoring on winter roads and check stations). An increase in the number of road and aerial patrols and hiring community monitors to work with renewable resource officers will result in increased costs for overtime, casual wages and travel by officers between regions. **Timeline: Ongoing.**

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Enhanced patrols	50,000	160,000 NEW	160,000 NEW	160,000 NEW	160,000 NEW
Community monitors	80,000	160,000 NEW	160,000 NEW	160,000 NEW	160,000 NEW
Total	$130,000	$320,000	$320,000	$320,000	$320,000

Payback and Results

- ✓ Increased joint monitoring with community monitors to promote compliance.
- ✓ Meat wastage will be reduced.

Strategy #11: Continue to work with the Department of Industry, Tourism and Investment and Aboriginal governments to support access to alternate country foods (such as fish, moose, bison and muskox) and meat sources and to promote alternate harvesting opportunities.

Management actions to ensure herds still at low numbers recover and grow will result in hardships for subsistence users of caribou. Measures to address hardships will focus on the traditional economy. Actions supporting this strategy:

- Work with communities to identify and provide access to alternative food sources and harvesting activities (Costs to be determined). **Timeline: Ongoing**.

Costs to be determined; will depend on action taken.

Payback and Results

- ✓ Harvest regulation are revised to provide alternative food sources.
- ✓ Economic hardships are addressed.
- ✓ Subsistence use of country foods is maintained.

Strategy #12: Work with the Department of Industry, Tourism and Investment and commercial ventures to address impacts to businesses.

Management actions to ensure herds recover and grow have impacted some businesses. Measures will be taken to maintain businesses throughout caribou cycles. Actions supporting this strategy:

- Analyze economic implications of specific caribou management actions implemented. **Timeline: As required**.
- Determine approach to mitigate business programs (could include business planning, product/market development, business relief). **Timeline: As required**.
- Hold engagement meetings with industry. **Timeline: As required**.

Action	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Address impacts to businesses	300,000 NEW	300,000 NEW	300,000 NEW	300,000 NEW	300,000 NEW
Total	$300,000	$300,000	$300,000	$300,000	$300,000

Payback and Results

✓ Businesses will be maintained.

Appendix B
Detailed Financial Summary (in $'000)

Principle	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
Engaging Partners					
Strategy #1	518	643	793	593	393
Strategy #2	0	0	0	0	0
Strategy #3	90	410	55	50	50
Information for Management Decisions					
Strategy #4	1,654[1]	2,345	1,933	1,205	1,175
Strategy #5	40	45	45	40	40
Managing the Impacts of Key Factors					
Strategy #6	380	435	455	430	430
Strategy #7	0	300	125	0	0
Public Education and Compliance					
Strategy #8	95	235	235	235	235
Strategy #9	0	105	105	105	105
Strategy #10	130	320	320	320	320
Maximizing Benefits					
Strategy #11[2]	TBD	TBD	TBD	TBD	TBD
Strategy #12	300	300	300	300	300
Total	3,207	5,138	4,366	3,278	3,048
Existing Resources	1,250	1,250	1,250	1,250	1,250
Partner Resources[3]	250	500	250	250	250
New Resources	1,707	3,388	2,866	1,778	1,548

[1] Does not include an estimated $850,000 from Nunavut for Beverly and Ahiak survey.
[2] Resources required will be determined based on management actions taken.
[3] Possible partners include the federal government, industry, NGOs and co-management partners.

Appendix C
Results of the 2006-2010 NWT Barren-ground Caribou Management Strategy

Strategy	Summary of Activities
#1: Work with co-management and other public processes to effectively identify caribou conservation issues and options for caribou conservation.	Between 2005 and 2007, consultation sessions were held in all Inuvialuit, Gwich'in and Sahtu communities on caribou management actions for declining herds. Communities on the Bathurst caribou range and in the South Slave region participated in the Bathurst Caribou Management Workshops in 2006, 2007, 2008 and 2009. ENR made presentations annually and met with the Wildlife Management Advisory Board (NWT), Sahtu Renewable Resources Board, Gwich'in Renewable Resources Board, Porcupine Caribou Management Board, Beverly and Qamanirjuaq Caribou Management Board and Wek'eezhii Renewable Resources Board. A Caribou Summit was held in Inuvik in January 2007, with representation from across the NWT and northern Canada. Wek'èezhìi Renewable Resources Board held a public hearing in March 2007 on ENR proposal for caribou management actions for Bathurst herd and in March 2010 on joint ENR/Tłı̨chǫ Government proposal for caribou management actions for herds in the North Slave region. Sahtu Renewable Resources Board held a public hearing to review proposed caribou management actions in November 2007. Updates to Dene Nation leadership meetings were provided and a caribou workshop was held in Yellowknife in December 2007.
#2: Track the implementation of existing management plans, update management plans, where needed, and develop management plans for herds where they do not exist.	Workshops have been held to discuss implementation of the draft Bathurst Caribou Management Plan in 2006, 2007, 2008 and 2009. In December 2007, ENR assisted wildlife co-management boards in Nunavut and Inuvialuit, Gwich'in, Sahtu and Tłı̨chǫ settlement regions to initiate the process to update the management plan for Bluenose herds. In 2007 and 2008, Wek'èezhìi Renewable Resources Board met with Tłı̨chǫ Government and ENR to begin to set up a process to develop a comprehensive management proposal for Bathurst herd as required under the Tłı̨chǫ Agreement. In 2010, the Porcupine Caribou Management Board's Harvest Management Plan was approved by all signatories to the Porcupine Caribou Management Agreement.

Strategy	Summary of Activities
#3: Establish inter-jurisdictional agreements, where needed, to enhance coordination and cooperation.	The governments of Nunavut, Saskatchewan and NWT collaborated to support a calving ground reconnaissance survey of the Beverly caribou herd in 2007. Representatives from the governments of Yukon, NWT, Nunavut, Saskatchewan and Quebec participated in the Caribou Summit. ENR attended Nunavut caribou planning session in November 2007. In December 2007, the Minister of ENR met with Nunavut and agreed that ENR would lead development of an inter-jurisdictional management agreement. A further meeting with Yukon and Nunavut was held in July 2009. In February 2007, ENR, Saskatchewan and the Prince Albert Grand Council began a process to jointly fund a position to monitor health and harvest of the Beverly and Ahiak herds. This program has been in place since 2009, working with communities and hunters in northern Saskatchewan.
#4: Enhance and promote the exchange of information on the status and use of caribou across the circumpolar north.	Meetings held with the Barren-ground Caribou Outfitters Association annually, often twice a year. Public meetings were held in Inuvik and Norman Wells in 2007 to address caribou declines and hardships. Public interest groups attended the Bathurst Caribou Management Workshops in 2006, 2007, 2008 and 2009 and the Caribou Summit in January 2007. ENR participated in the Circum Arctic Rangifer Monitoring and Assessment (CARMA) Network meetings 2007-2010. CARMA was successful in securing International Polar Year funding to increase monitoring activities around the arctic. ENR accessed this funding in 2007-2008.

Strategy	Summary of Activities
#5: Implement monitoring actions necessary to determine the status of all NWT caribou herds and to understand factors driving changes in herd status.	Sixty VHF collars were deployed on the Cape Bathurst, Bluenose-West and Bluenose-East herds in March 2006. These collars ensured that animals in the herds could be located during the post-calving photo censuses conducted in July 2006. A similar effort was made for the surveys in July 2009. Calving ground photographic surveys of the Bathurst caribou herd were conducted in June 2006 and 2009. A reconnaissance survey of the Ahiak calving ground was conducted in June 2006, 2007, 2008, 2009 and 2010. Reconnaissance surveys of the Beverly calving ground were conducted in June 2007, 2008, 2009 and 2010. Late winter composition counts were conducted on the Cape Bathurst, Bluenose-West, Bluenose-East and Bathurst herds in March and April 2006, 2007, 2008, 2009 and 2010. Adult sex ratios for the Bathurst herd were determined in fall 2006, 2007 and 2008, and for the Bluenose-East and Bluenose-West herds in 2009. A total of 20 collars were deployed on the Beverly and Ahiak herds in March 2006. Eighteen collars were deployed on Beverly and Ahiak caribou in July 2007, and 30 collars in April 2008.
#6: Identify and implement studies necessary to understand caribou ecology, including the role of predators.	Wolf den occupancy surveys and pup survival surveys were conducted on the Bathurst caribou range in 2006, 2007, 2008, 2009 and 2010. The carcasses of more than 100 harvested wolves were examined to determine age and sex of the harvest and breeding success of female wolves in spring 2006. Very few wolves (less than 25) were harvested in 2007, 2008 and 2009 in the North Slave region. Research projects were initiated in summer 2007 with the University of Northern British Columbia to look at the influence of insects on Bathurst caribou behaviour in summer, and to study the use of winter range in burned and unburned areas of the Bathurst winter range. Further work in this program included: a study of community knowledge of forest fire ecology in Tłı̨chǫ communities; developing projects to assess forest fire history on the Bathurst winter range; and modelling likely forest fire dynamics into the future with various climate scenarios. An additional study was developed with the Remote Sensing Centre in Ottawa to evaluate trends in vegetation productivity over time on spring and summer ranges of a number of caribou herds.

Strategy	Summary of Activities
#7: Develop population models that incorporate key demographic data, traditional knowledge and community-based knowledge to evaluate proposed management options.	A model was developed to evaluate mechanisms for population decline in the Bathurst caribou herd. This work was extended in 2009-2010 to evaluate likely Bathurst recovery with varying harvest levels and calf productivity. A modelling workshop with wildlife co-management boards was held in May 2009. Additional workshops were held with community representatives from the Sahtu, North and South Slave regions in October 2009. A research project initiated in summer 2007 with the University of Northern British Columbia investigated the interaction between use of winter range in burned and unburned areas of the Bathurst winter range and herd dynamics.
#8: Evaluate the impacts of harvesting (including predation) on herd declines and recovery and implement strategies to reduce harvest impacts.	Based on recommendations from co-management boards, commercial and resident harvesting was eliminated in the Inuvialuit, Gwich'in and Sahtu settlement areas in 2006. In 2006, the number of tags available to each resident hunter in the rest of the NWT was reduced from five to two and limited to bulls only. In response to request from Sahtu Renewable Resources Board in November 2007, a workshop was held in May 2009 with the Sahtu, Gwich'in, Inuvialuit (WMAC) and Tłı̨chǫ Renewable Resource Boards (WRRB) to understand declines in the Porcupine, Bathurst and Bluenose-West herds and to assess the role of harvest in these declines, using two different population models (noted above). Joint check stations operated on the Dempster Highway, Tibbett to Contwoyto winter road and Tłı̨chǫ winter roads in 2006, 2007, 2008, 2009 and 2010. In 2008 and 2009 a check station was set up on the Discovery road. Release of the locations of collared caribou to the public was delayed by two weeks following the Inuvik Caribou Summit and locations were removed from the ENR website as a conservation measure.

Strategy	Summary of Activities
#9: Identify, monitor and mitigate impacts of exploration and development activities and improve understanding of the mechanisms for any impacts.	ENR has worked with the monitoring agencies for the three existing diamond mines in the Bathurst range to review current wildlife effects monitoring and mitigation programs established for diamond exploration and mining activities. A workshop was held with diamond mines in September 2009. ENR has reviewed proposed wildlife effects monitoring and mitigation programs for oil and gas exploration and development activities in the Parsons Lake area and the proposed road to Tuktoyaktuk. ENR reviews all land use applications and provides recommendations to minimize impacts to caribou.
#10: Develop models to assess the cumulative effects of human and natural impacts.	A workshop was held in February 2008 with Indian and Northern Affairs Canada, Aboriginal organizations, management boards, industry and others to examine three models for assessing cumulative effects on caribou. An integrated modelling approach is being developed for broader use for the Bathurst and other herds. A research project initiated in summer 2007 with the University of Northern British Columbia investigated the interaction between use of winter range in burned and unburned areas of the Bathurst winter range and herd dynamics.
#11: Develop and implement a public information and education program.	A communications strategy has been prepared and communication products produced, including updated web materials, information on identification of bull caribou, television spots and community information pamphlets. This includes Public Service Announcements (PSAs) on responsible hunting and announcements in spring to prevent meat wastage. With assistance from World Wildlife Fund, Walter and Duncan Gordon Foundation and University of Calgary, an interactive program titled "Caribou and People – A Shared Future" was developed and provided as a DVD to schools and people involved in conservation education in fall 2009. This DVD contains modules on all aspects of caribou ecology and management.
#12: Promote hunting excellence.	Public Service Announcements have highlighted the need for hunting excellence. This message has been reinforced at winter road check stations and in community meetings. Inuvik region undertook programs to improve marksmanship and reduce wounding loss in 2008, 2009 and 2010.

Strategy	Summary of Activities
#13: Document and publicize community-based hunting rules.	Community, RRC and HTC meetings were organized across the NWT and included lengthy discussions of how hunting needs to be conducted and the need for respect for caribou. Discussions at the Bathurst caribou workshops and the Caribou Summit highlighted and publicized caribou harvest rules. In 2007-2008, funding was provided for three years to the Sahtu Renewable Resources Board to document traditional hunting rules. Funding was also provided through West Kitikmeot Slave Study to the Tłı̨chǫ for a similar project.
#14: Enhance compliance programs.	Compliance activity was enhanced on all caribou herd ranges, with increased patrols in 2006, 2007, 2008, 2009 and 2010.
#15: Work with the Department of Industry, Tourism and Investment and impacted communities to identify hardships and identify possible solutions, including alternate meat sources and alternate harvesting opportunities.	The availability of reindeer in the Inuvialuit Settlement Region was investigated as a possible alternate source of country foods by the Department of Industry, Tourism and Investment. A workshop on dealing with the hardships resulting from low caribou numbers was held in Inuvik in November 2006. ITI has developed tourism programs to assist outfitting industry.
#16: Work with the Department of Industry, Tourism and Investment, outfitters and other commercial ventures to identify ways to maintain viability of businesses through changes in caribou numbers and distribution.	The mining and oil and gas industries are aware of the status of the caribou herds and received copies of the 2006-2010 NWT Caribou Management Strategy. Discussions on caribou management were held with oil and gas representatives in conjunction with the review of the Mackenzie Gas Project. Industry participated in the Caribou Summit in January 2007. Discussions of caribou management are held with the diamond mines during the annual reviews of their Wildlife Effects Monitoring Programs. ITI has developed tourism programs to assist outfitting industry.

Northwest Territories Environment and Natural Resources

February 2011